CLAIMS

We claim:

1. An RF coupled implantable medical system comprising:

a transmitting unit;

a receiving unit including an implantable, electrically operated, medical device ;

said transmitting unit including RF energy transmitting means, RF signal receiving means and first control means coupled to said RF energy transmitting means and to said RF signal receiving means for controlling the amount of RF energy transmitted to said receiving unit; and

said receiving unit including RF energy receiving means, RF signal transmitting means, a rechargeable power supply coupled to said RF energy receiving means and second control means coupled to said rechargeable power supply means, to said RF energy receiving means, to said RF signal transmitting means and to said implanted medical device.

2. The system of claim 1 wherein said receiving unit includes a titanium housing enclosing said RF energy receiving means, said RF signal transmitting means, said rechargeable power supply and said second control means.

3. The system of claim 1 wherein said RF energy transmission means of said transmitting unit is constructed and arranged to transmit energy at a frequency between 10 Hz and 500,000 Hz.

4. The system of claim 1 wherein said rechargeable power supply has a temperature sensor which is mounted closely adjacent thereto and which is coupled to said control means in said receiving unit whereby the recharging of said rechargeable power supply can be controlled relative to the temperature of said rechargeable power supply thereby to prevent gas generation and loss of electrolyte by said rechargeable power supply.

5. The system of claim 1 wherein said RF energy transmitting means of said transmitting unit is constructed and arranged to recharge said rechargeable power supply at a "fast" (high energy) rate or a "trickle" (low to medium energy) rate.

6. The system of claim 1 wherein said transmitting unit includes mode selection means for setting said transmitting

unit to operate in one of three modes, namely (1) "RF only", (2) "battery only" or (3) "combination".

7. The system of claim 6 wherein said receiving unit, when said transmitting unit is set to operate in said "RF only" mode, is operable to supply electrical energy to said implantable device through a rectifier directly to said implanted medical device, so long as said transmitting unit is located proximate to said receiving unit.

8. The system of claim 6 wherein said receiving unit, when said transmitting unit is set to operate in said "battery only" mode, is operable, periodically, to supply electrical energy to said implantable device from said rechargeable power supply for a period of at least 7 days.

9. The system of claim 6 wherein said receiving unit, when said transmitting unit is set to operate in said "combination" mode, is operable to supply electrical energy to said implantable device through a rectifier directly to said implanted medical device, so long as said transmitting unit is located proximate to said receiving unit, and, separately, to "trickle charge" said rechargeable power supply.

10. The system of claim 1 wherein said control means of said transmitting unit is constructed and arranged to control the level of RF energy transfer from the transmitting unit to the receiving unit relative to one or more of various parameters which include (a) proximity of said transmitting unit to said receiving unit, (b) the output voltage of said rechargeable power supply and (c) the temperature of said rechargeable power supply.

11. The system of claim 1 wherein said system is constructed and arranged so that said receiving unit, upon sensing a fully charged power source, will automatically terminate the transmission of RF energy by said transmitting unit, by telemetering a specific "stop" command to said transmitting unit.

12. The system of claim 1 wherein said transmitting unit includes a visual display coupled to said control means.

13. The system of claim 1 wherein said transmitting unit includes a keyboard coupled to said control means.

14. The system of claim 9 wherein said keyboard includes

keys to start and stop recharging the rechargeable power source within the implantable medical device.

15. The system of claim 1 wherein said implanted medical device is a tissue stimulator.

16. The system of claim 1 wherein said implanted medical device is a drug delivery system.

17. The system of claim 1 wherein said implanted medical device is a cardiac pacemaker system.

18. The system of claim 1 wherein said implanted medical device is a cardioverter/defibrillator.

add a2) 19. The system of claim 1 wherein said transmitting unit has a self contained power supply, such as a battery, whereby said transmitting unit is portable and not dependant upon an a.c. power source.

20. The system of claim 19 wherein said self contained power source in said transmitting unit is rechargeable.

add a3)